```
CTGGCTAGCC TCACTTGGTA GACAGCCCTG ACAGCCTCAC TGGCTGGGGG TCGAAAGGCC AGTCAATATC TTGGTCACTG   80
CTAATAGTTC CTTGCTACGC GCAAAAAGCT CCTTGCCGAA GGGGCACAGA CTATCAAGTG AGACATATAG GATGCATGTC  160
TTTCATAGCC ACAGTTAGGG TGGTGACCTA CTCGAAGAGG CCCCGACTTG CATGCATACG ACATGTCGCT TCCATGCAAC  240
ATGTATGCGC ACATCGGCGA TCAGGCACCC TCTGCATGCA GAATAGAACC CCCCTGGTTT CCTTTTGTTT CTTTTCCTTT  320
CTCAACGACG CGTGAGCGTG GTTAACTTGA GCAAGGCCGA GTGGTCTGTT CACGAGGTTA CCATCGAACT CTCTTCTTTC  400
CCAATCATGA CCTGCCCCCC GAGTTTAGCC CCCATCACGG CTGTGAAATC CACTTCGATA ATCCTAGCCT AGTGCTACTC  480
TTCAATAGTT GCTCCTGATG GGGCACTTTG GTCACATTGC CTTGGTTYCT CCTACCTCGT TCTCTTCCGC ATCAAGCCTC  560
TATGCCCGAC GACAACACCT CATTGGCCCG GACCACTTTG AGCGCGCACG CACCTTCGCG CCGAAGGAGT TGATAACACC  640
CTTCACCCTT GCCCAATGAT GGAGTTTTGG TCTATTTGTC ATGATCACCT CACATTCACT AGATCACGGA TCCTGGAAGA  720
GGGTGTGGAA GCCAGACCAG CTTGTCCCTG TTCTTGCAGA CTCAGGTCAG CTCCTAGCGG CTATCACAGC TCAGGATTAT  800
CAAGTCCCGT AAAGTCCAGA CCCTTTTCAT TGTATGATGC TGCCTAATTT GCGCTATCTC TATGCCGTAG CAGCCGTCTT  880
GGCTACAACT GGCTGCCATG GCTGAAGCAT CGTGAGATCT ATAAAGGTCT CCGAATCCTC GGTGAAGTCA GAATCGTCTC  960
TCCACACCAG TCAACAACAA GCTTCTTTCT CTTACAGCTT AGCCTGAGCA CATTCACAGA ACTCTTCCCT TCTTTTCGTC 1040
AATATGCTGT TCAAGTCATG GCAACTGGCA GCAGCCTCCG GGCTCCTGTC TGGAGTCCTC GGCATCCCGA TGGACACCGG 1120
CAGCCACCCC ATTGAGGCTG TTGATCCCGA AGTGAAGACT GAGGTCTTCG CTGACTCCCT CCTTGCTGCA GCAGGCGATG 1200
ACGACTGGGA GTCACCTCCA TACAACTTGC TTTACAGGTG AGACACCTGT CCCACCTGTT TTCCCTCGAT AACTAACTCT 1280
TATAGGAATG CCCTGCCAAT TCCACCTGTC AAGCAGCCCA AGATGTATGT CTTTGATTTT CTACGAAGCA ACTCGGCCCC 1360
GACTAATGTA TTCTAGGATC ATTACCAACC CTGTCACCGG CAAGGACATT TGGTACTATG AGATCGAGAT CAAGCCATTT 1440
CAGCAAAGGG TGAGTTTGCT CAGAAACCTT GTGGTAATTA ATCATTGTTA CTGACCCTTT CAGATTTACC CCACCTTGCG 1520
CCCTGCCACT CTCGTCGGCT ACGATGGCAT GAGCCCTGGT CCTACTTTCA ATGTTCCCAG AGGAACAGAG ACTGTAGTTA 1600
GGTTCATCAA CAATGCCACC GTGGAGAACT CGGTCCATCT GCACGGCTCC CCATCGCGTG CCCCTTTCGA TGGTTGGGCT 1680
GAAGATGTGA CCTTCCCTGG CGAGTACAAG GATTACTACT TTCCCAACTA CCAATCCGCC CGCCTTCTGT GGTACCATGA 1760
CCACGCTTTC ATGAAGGTAT GCTACGAGCC TTTATCTTTC TTGGCTACCT TTGGCTAACC AACTTCCTTT CGTAGACTGC 1840
TGAGAATGCC TACTTTGGTC AGGCTGGCGC CTACATTATC AACGACGAGG CTGAGGATGC TCTCGGTCTT CCTAGTGGCT 1920
```

FIG._1A

```
ATGGCGAGTT CGATATCCCT CTGATCCTGA CGGCCAAGTA CTATAACGCC GATGGTACCC TGCGTTCGAC CGAGGGTGAG  2000
GACCAGGACC TGTGGGGAGA TGTCATCCAT GTCAACGGAC AGCCATGGCC TTTCCTTAAC GTCCAGCCCC GCAAGTACCG  2080
TTTCCGATTC CTCAACGCTG CCGTGTCTCG TGCTTGGCTC CTCTACCTCG TCAGGACCAG CTCTCCCAAC GTCAGAATTC  2160
CTTTCCAAGT CATTGCCTCT GATGCTGGTC TCCTTCAAGC CCCCGTTCAG ACCTCTAACC TCTACCTTGC TGTTGCCGAG  2240
CGTTACGAGA TCATTATTGG TATGCCCTCC CCTCTCACGA ATGAGTCAAG AACTCTAAGA CTAACACTTG TAGACTTCAC  2320
CAACTTTGCT GGCCAGACTC TTGACCTGCG CAACGTTGCT GAGACCAACG ATGTCGGCGA CGAGGATGAG TACGCTCGCA  2400
CTCTCGAGGT GATGCGCTTC GTCGTCAGCT CTGGCACTGT TGAGGACAAC AGCCAGGTCC CCTCCACTCT CCGTGACGTT  2480
CCTTTCCCTC CTCACAAGGA AGGCCCCGCC GACAAGCACT TCAAGTTTGA ACGCAGCAAC GGACACTACC TGATCAACGA  2560
TGTTGGCTTT GCCGATGTCA ATGAGCGTGT CCTGGCCAAG CCCGAGCTCG GCACCGTTGA GGTCTGGGAG CTCGAGAACT  2640
CCTCTGGAGG CTGGAGCCAC CCCGTCCACA TTCACCTTGT TGACTTCAAG ATCCTCAAGC GAACTGGTGG TCGTGGCCAG  2720
GTCATGCCCT ACGAGTCTGC TGGTCTTAAG GATGTCGTCT GGTTGGGCAG GGGTGAGACC CTGACCATCG AGGCCCACTA  2800
CCAACCCTGG ACTGGAGCTT ACATGTGGCA CTGTCACAAC CTCATTCACG AGGATAACGA CATGATGGCT GTATTCAACG  2880
TCACCGCCAT GGAGGAGAAG GGATATCTTC AGGAGGACTT CGAGGACCCC ATGAACCCCA AGTGGCGCGC CGTTCCTTAC  2960
AACCGCAACG ACTTCCATGC TCGCGCTGGA AACTTCTCCG CCGAGTCCAT CACTGCCCGA GTGCAGGAGC TGGCCGAGCA  3040
GGAGCCGTAC AACCGCCTCG ATGAGATCCT GGAGGATCTT GGAATCGAGG AGTAAACCCC GAGCCACAAG CTCTACAATC  3120
GTTTTGAGTC TTAAGACGAG GCTCTTGGTG CGTATTCTTT TCTTCCCTAC GGGGAACTCC GCTGTCCACT GCGATGTGAA  3200
GGACCATCAC AAAGCAACGT ATATATTGGA CTCACCACTG TCATTACCGC CCACTTGTAC CTATTCGATT CTTGTTCAAA  3280
CTTTTCTAGT GCGAGAGTGT CCATAGTCAA GAAACGCCCA TAGGGCTATC GTCTAAACTG AACTATTGTG TGGTCTGTGA  3360
CGTGGAGTAG ATGTCAATTG TGATGAGACA CAGTAAATAC GGTATATCTT TTCCTAGGAC TACAGGATCA GTTTCTCATG  3440
AGATTACATC CGTCTAATGT TTGTCCATGA GAGTCTAGCT AAGGTTGAGA ATGCATCAGA CGGAATCATT TGATGCTCTC  3520
AGCTCGTATT ACCGATGTAA GACAAGTTAG GTAAGTTGCT TGGTATCCGA AAATGACTCA GGCTCCCTCA TTAGGTTGCA  3600
TGTGAAAACC TTCAGCAACT CATGGGTGTT GGGACCAAAT CATCCATACC TGATTTTGAT AACTGACCTG GGTCAAT      3677
```

FIG._1B

GTGGCGTCGG GGATCCACCT GAATCATGAG ATATAAAGAG AGGGATGTTC TGTCAACAAT AATCCCATCA TCAGCTTTTG 80
AACATTCTCA GCTCATCAAA GATTTTCTTC AAGATGGTCG CCAAATACCT CTTCTCAGCA CTTCAACTCG TTTCAATTGC 160
GAAAGGCATA TACGGYGTCG CTTTGAGCGA ACGTCCCGCC AAATTTGTCG ACAACACCCC CGACGAAGAA AAGGCTGCCT 240
TGGCGTCAAT TGTTGAAGAT GACCCTGCGG ATGTTGTCAA CATGCTGAAA GACTGGCAAA GCCCGGAGTA TCCTCTCATT 320
TTTCGCCAAC CACTGCCCAT CCCTCCAGCC AAGGAACCAA AGTAGTGAGT GTTCAATCGC ATCGACAGGT TTCTTAGAAT 400
ATACTCACCA TCCACAGTAA ACTCACGAAT CCTGTCACAA ACAAGGAGAT ATGGTACTAC GAGATTGTCA TCAAACCCTT 480
CACCCAGCAG GTCTATCCAA GCCTGCGCCC TGCTCGTTTA GTAGGCTATG ACGGCATCTC CCCAGGTCCT ACGATCATAG 560
TGCCGAGAGG AACAGAAGCT GTTGTACGGT TTATAAACCA GGGTGATCGC GAAAGCTCCA TCCATCTCCA CGGCTCCCCC 640
TCCCGTGCCC CTTTTGACGG ATGGGCTGAT GATATGATCA TGAAGGGGGA ATACAAAGGT ACGATAGCGT GTGATTCTAC 720
GCATCAGGAA GCCTCTATCA TACTAACAGG ACTTTCTTCT CAGACTACTA CTACCCGAAC AACCAAGCTG CCAGATTTTT 800
GTGGTACCAC GATCATGCTA TGCATGTTGT AAGTCTTTAC CGACTTTTCA TGGTAGTGAA ACGGAAGGAT TAAGCTAACA 880
TCTGTGCAGA CCGCAGAAAA TGCCTATTTC GGGCAAGCCG GCGCCTACCT GATCACAGAC CCGGCTGAGG ATGCTCTCGG 960
CCTTCCTTCA GGTTACGGAA AATACGACAT TCCGCTGGTC CTCAGTTCCA AGTACTACAA CGCCGATGGA ACTCTTAAGA 1040
CCAGTGTGGG AGAAGACAAG AGTGTTTGGG GCGACATCAT CCATGTCAAC GGTCAGCCCT GGCCATTCTT AAATGTTGAG 1120
CCTCGAAAGT ATCGTCTTCG ATTCCTCAAC GCGGCTGTTT CTAGGAACTT TGCCCTTTAC TTCGTCAAGC AAGACAACAC 1200
TGCCACTAGG CTTCCTTTCC AGGTCATTGC CTCTGATGCA GGGCTACTCA CACACCCGGT TCAAACCTCA GATATGTATG 1280
TTGCAGCCGC AGAACGCTAC GAGATTGTGT TCGATTTCGC GCCCTATGCC GGCCAAACGT TGGATCTGCG CAACTTCGCA 1360
AAGGCCAATG GTATCGGTAC CGACGACGAC TACGCAAACA CTGACAAGGT CATGCGTTTC CACGTCAGCA GCCAAACAGT 1440
CGTCGATAAC TCCGTGGTAC CCGAGCAGCT ATCTCAGATC CAGTTCCCCG CGGACAAAAC CGACATAGAC CATCACTTCC 1520
GTTTCCATCG TACCAACGGC GAGTGGCGCA TCAACGGCAT CGGGTTTGCA GACGTCGAGA ACCGTGTTCT TGCCAAGGTA 1600
CCGCGCGGTA CTGTCGAGCT TTGGGAACTT GAGAACAGCT CCGGCGGCTG GTCACACCCC ATCCACGTCC ACCTAGTAGA 1680
CTTCCGAGTC GTCGCACGCT ACGGCGACGA AGGCACTCGC GGCGTCATGC CCTATGAGGC CGCCGGTCTC AAGGACGTCG 1760
TGTGGCTCGG CCGTCACGAG ACGGTCCTCG TCGAAGCACA TTACGCCCCA TGGGACGGAG TCTACATGTT CCACTGCCAC 1840
AACCTCATCC ACGAAGACCA AGACATGATG GCCGCCTTCG ACGTGACTAA ACTCCAGAAC TTTGGGTACA ACGAGACGAC 1920
TGATTTCCAC GATCCTGAGG ATCCTCGCTG GTCAGCAAGA CCTTTCACCG CGGGTGATCT CACGGCGCGA TCGGGTATCT 2000
TTTCAGAAGA ATCCATCAGG GCTAGAGTAA ATGAGTTGGC GCTCGAGCAG CCTTACAGCG AACTCGCACA AGTTACAGCC 2080
TCGCTCGAGC AGTACTACAA GACGAACCAG AAACGCCACG ACGAGTGCGA AGACATGCCT GCTGGCCCTA TCCCCCGTTA 2160
TCGTAGGTTT CAGGTCTGAT TCAAGTTGTT TTGGTGGTGC AACTTCTCCT TCTTCTCTCC ATTGAACTTA ATTGTAGATG 2240
ATGGATACAC ACTCACTTCT CCCTTTCTAT CTCGACGCTT TGGCCATTTT ATTTGGTCTT ATTGTGCTAT ATACTGTCTA 2320
TTTCTCTTTC GTATACGAGC AATGTATGTC TTGGTCGGAG TCTTGTGGAG CTGCTGAGGT GACACCTCGC GACGCCATCT 2400
TAGCAGTTTT CGTAACTCTC GTCTATTTGT GATTACTTTG TTCCTTAATC AGTAACAGCT TGATGTTAGA TTAGCAATGA 2480
GACGAACGAT GAAGCAATCT GAGATGGATC CTTTTTTTTT CCTAATATTT GTATACTAAA GAATGTGAAC AATGCCGTTT 2560
TATGAAATGC TCATAACATG CAGCATATTT ACTTTGTTCT ATTTCATTTC ATTTTCATAT GTACGCATAT CCTCGGCATC 2640
AGACAAGAGA CGCGACAACG CTCTCTGCAT CCCTTCTCGG CCCGTAATTC CGTAGAAAAT GACCGACGGG AAAGCAGTCC 2720
TCCACGCGCT CCATGCTCAT CATGCTGCGT ACTATGTATC CCCTTCCAAC GCGGATGGCG CGGATGTCGC TGCGAACCCA 2800
TTGAATGGGC ATCACGACAG CCATCATGTC GCTAAGGACG GATTCTTCTT CGGATGCAAT GCTTGTGAGG GGGTTTTCTG 2880
CATCCCAGCA AGATGAGGTG GATCC

FIG._2

```
MVAKYLFSAL QLVSIAKGIY GVALSERPAK FVDNTPDEEK AALASIVEDD  50
PADVVNMLKD WQSPEYPLIF RQPLPIPPAK EPNKLTNPVT NKEIWYYEIV 100
IKPFTQQVYP SLRPARLVGY DGISPGPTII VPRGTEAVVR FINQGDRESS 150
IHLHGSPSRA PFDGWADDMI MKGEYKDYYY PNNQAARFLW YHDHAMHVTA 200
ENAYFGQAGA YLITDPAEDA LGLPSGYGKY DIPLVLSSKY YNADGTLKTS 250
VGEDKSVWGD IIHVNGQPWP FLNVEPRKYR LRFLNAAVSR NFALYFVKQD 300
NTATRLPFQV IASDAGLLTH PVQTSDMYVA AAERYEIVFD FAPYAGQTLD 350
LRNFAKANGI GTDDDYANTD KVMRFHVSSQ TVVDNSVVPE QLSQIQFPAD 400
KTDIDHHFRF HRTNGEWRIN GIGFADVENR VLAKVPRGTV ELWELENSSG 450
GWSHPIHVHL VDFRVVARYG DEGTRGVMPY EAAGLKDVVW LGRHETVLVE 500
AHYAPWDGVY MFHCHNLIHE DQDMMAAFDV TKLQNFGYNE TTDFHDPEDP 550
RWSARPFTAG DLTARSGIFS EESIRARVNE LALEQPYSEL AQVTASLEQY 600
YKTNQKRHDE CEDMPAGPIP RYRRFQV
```

FIG._3

```
M----LFKSWQLAAASGLLSGVLGIPMDTGSHPIEAVDPEVKTEVFADSLLAAAGD-----DDWESPPYNLLYRNALPIPPVKQPKMIITNPVTG   86
MVAKYLFSALQLVSIA---KGIYGVALSERPAKFVDNTPDEEKAALASIVEDDPADVVNMLKDWQSPEYPLIFRQPLPIPPAKEPNKL-TNPVTN   91

KDIWYYEIEIKPFQQRIYPTLRPATLVGYDGMSPGPTFNVPRGTETVVRFINNATVENSVHLHGSPSRAPFDGWAEDVTFPGEYKDYYFPNYQSA  180
KEIWYYEIVIKPFTQQVYPSLRPARLVGYDGISPGPTIIVPRGTEAVVRFINQGDRESSIHLHGSPSRAPFDGWADDMIMKGEYKDYYYPNNQAA  186

RLLWYHDHAFMKTAENAYFGQAGAYIINDEAEDALGLPSGYGEFDIPLILTAKYYNADGTLRSTEGEDQDLWGDVIHVNGQPWPFLNVQPRKYRF  276
RFLWYHDHAMHVTAENAYFGQAGAYLITDPAEDALGLPSGYGKYDIPLVLSSKYYNADGTLKTSVGEDKSVWGDIIHVNGQPWPFLNVEPRKYRL  281

RFLNAAVSRAWLLYLVRTSSPNVRIPFQVIASDAGLLQAPVQTSNLYLAVAERYEIIIDFTNFAGQTLDLRNVAETNDVGDEDEYARTLEVMRFV  371
RFLNAAVSRNFALYFVKQDNTATRLPFQVIASDAGLLTHPVQTSDMYVAAAERYEIVFDFAPYAGQTLDLRNFAKANGIGTDDDYANTDKVMRFH  376

VSSGTVEDNSQVPSTLRDVPFPPHKEGPADKHFKFERSNGHYLINDVGFADVNERVLAKPELGTVEVWELENSSGGWSHPVHIHLVDFKILKRTG  466
VSSQTVVDNSVVPEQLSQIQFPADKTD-IDHHFRFHRTNGEWRINGIGFADVENRVLAKVPRGTVELWELENSSGGWSHPIHVHLVDFRVVARYG  470

GRGQ--VMPYESAGLKDVVWLGRGETLTIEAHYQPWTGAYMWHCHNLIHEDNDMMAVFNVTAMEEKGYLQE-DFEDPMNPKWRAVPYNRNDFHAR  558
DEGTRGVMPYEAAGLKDVVWLGRHETVLVEAHYAPWDGVYMFHCHNLIHEDQDMMAAFDVTKLQNFGYNETTDFHDPEDPRWSARPFTAGDLTAR  565

AGNFSAESITARVQELAEQEPYNRLDEILEDLGIEE                                                              594
SGIFSEESIRARVNELALEQPYSELAQVTASLEQYYKTNQKRHDECEDMPAGPIPRYRRFQV                                    627
```

FIG._4

```
GTCAATATGCTGTTCAAGTCATGGCAACTGGCAGCAGCCTCCGGGCTCCTGTCTGGAGTCCTCGGCATCCCGATGGACACCGGCAGCCAC  90
     M  L  F  K  S  W  Q  L  A  A  A  S  G  L  L  S  G  V  L  G  I  P  M  D  T  G  S  H  28

CCCATTGAGGCTGTTGATCCCGAAGTGAAGACTGAGGTCTTCGCTGACTCCCTCCTTGCTGCAGCAGGCGATGACGACTGGGAGTCACCT 180
 P  I  E  A  V  D  P  E  V  K  T  E  V  F  A  D  S  L  L  A  A  A  G  D  D  D  W  E  S  P  58

CCATACAACTTGCTTTACAGGAATGCCCTGCCAATTCCACCTGTCAAGCAGCCCAAGATGATCATTACCAACCCTGTCACCGGCAAGGAC 270
 P  Y  N  L  L  Y  R  N  A  L  P  I  P  P  V  K  Q  P  K  M  I  I  T  N  P  V  T  G  K  D  88

ATTTGGTACTATGAGATCGAGATCAAGCCATTTCAGCAAAGGATTTACCCCACCTTGCGCCCTGCCACTCTCGTCGGCTACGATGGCATG 360
 I  W  Y  Y  E  I  E  I  K  P  F  Q  Q  R  I  Y  P  T  L  R  P  A  T  L  V  G  Y  D  G  M  118

AGCCCTGGTCCTACTTTCAATGTTCCCAGAGGAACAGAGACTGTAGTTAGGTTCATCAACAATGCCACCGTGGAGAACTCGGTCCATCTG 450
 S  P  G  P  T  F  N  V  P  R  G  T  E  T  V  V  R  F  I  N  N  A  T  V  E  N  S  V  H  L  148

CACGGCTCCCCATCGCGTGCCCCTTTCGATGGTTGGGCTGAAGATGTGACCTTCCCTGGCGAGTACAAGGATTACTACTTTCCCAACTAC 540
 H  G  S  P  S  R  A  P  F  D  G  W  A  E  D  V  T  F  P  G  E  Y  K  D  Y  Y  F  P  N  Y  178

CAATCCGCCCGCCTTCTGTGGTACCATGACCACGCTTTCATGAAGACTGCTGAGAATGCCTACTTTGGTCAGGCTGGCGCCTACATTATC 630
 Q  S  A  R  L  L  W  Y  H  D  H  A  F  M  K  T  A  E  N  A  Y  F  G  Q  A  G  A  Y  I  I  208

AACGACGAGGCTGAGGATGCTCTCGGTCTTCCTAGTGGCTATGGCGAGTTCGATATCCCTCTGATCCTGACGGCCAAGTACTATAACGCC 720
 N  D  E  A  E  D  A  L  G  L  P  S  G  Y  G  E  F  D  I  P  L  I  L  T  A  K  Y  Y  N  A  238

GATGGTACCCTGCGTTCGACCGAGGGTGAGGACCAGGACCTGTGGGGAGATGTCATCCATGTCAACGGACAGCCATGGCCTTTCCTTAAC 810
 D  G  T  L  R  S  T  E  G  E  D  Q  D  L  W  G  D  V  I  H  V  N  G  Q  P  W  P  F  L  N  268

GTCCAGCCCCGCAAGTACCGTTTCCGATTCCTCAACGCTGCCGTGTCTCGTGCTTGGCTCCTCTACCTCGTCAGGACCAGCTCTCCCAAC 900
 V  Q  P  R  K  Y  R  F  R  F  L  N  A  A  V  S  R  A  W  L  L  Y  L  V  R  T  S  S  P  N  298
```

FIG._5A

```
GTCAGAATTCCTTTCCAAGTCATTGCCTCTGATGCTGGTCTCCTTCAAGCCCCCGTTCAGACCTCTAACCTCTACCTTGCTGTTGCCGAG  990
 V  R  I  P  F  Q  V  I  A  S  D  A  G  L  L  Q  A  P  V  Q  T  S  N  L  Y  L  A  V  A  E   328

CGTTACGAGATCATTATTGACTTCACCAACTTTGCTGGCCAGACTCTTGACCTGCGCAACGTTGCTGAGACCAACGATGTCGGCGACGAG 1080
 R  Y  E  I  I  I  D  F  T  N  F  A  G  Q  T  L  D  L  R  N  V  A  E  T  N  D  V  G  D  E   358

GATGAGTACGCTCGCACTCTCGAGGTGATGCGCTTCGTCGTCAGCTCTGGCACTGTTGAGGACAACAGCCAGGTCCCCTCCACTCTCCGT 1170
 D  E  Y  A  R  T  L  E  V  M  R  F  V  V  S  S  G  T  V  E  D  N  S  Q  V  P  S  T  L  R   388

GACGTTCCTTTCCCTCCTCACAAGGAAGGCCCCGCCGACAAGCACTTCAAGTTTGAACGCAGCAACGGACACTACCTGATCAACGATGTT 1260
 D  V  P  F  P  P  H  K  E  G  P  A  D  K  H  F  K  F  E  R  S  N  G  H  Y  L  I  N  D  V   418

GGCTTTGCCGATGTCAATGAGCGTGTCCTGGCCAAGCCCGAGCTCGGCACCGTTGAGGTCTGGGAGCTCGAGAACTCCTCTGGAGGCTGG 1350
 G  F  A  D  V  N  E  R  V  L  A  K  P  E  L  G  T  V  E  V  W  E  L  E  N  S  S  G  G  W   448

AGCCACCCCGTCCACATTCACCTTGTTGACTTCAAGATCCTCAAGCGAACTGGTGGTCGTGGCCAGGTCATGCCCTACGAGTCTGCTGGT 1440
 S  H  P  V  H  I  H  L  V  D  F  K  I  L  K  R  T  G  G  R  G  Q  V  M  P  Y  E  S  A  G   478

CTTAAGGATGTCGTCTGGTTGGGCAGGGGTGAGACCCTGACCATCGAGGCCCACTACCAACCCTGGACTGGAGCTTACATGTGGCACTGT 1530
 L  K  D  V  V  W  L  G  R  G  E  T  L  T  I  E  A  H  Y  Q  P  W  T  G  A  Y  M  W  H  C   508

CACAACCTCATTCACGAGGATAACGACATGATGGCTGTATTCAACGTCACCGCCATGGAGGAGAAGGGATATCTTCAGGAGGACTTCGAG 1620
 H  N  L  I  H  E  D  N  D  M  M  A  V  F  N  V  T  A  M  E  E  K  G  Y  L  Q  E  D  F  E   538

GACCCCATGAACCCCAAGTGGCGCGCCGTTCCTTACAACCGCAACGACTTCCATGCTCGGCTGGAAACTTCTCCGCCGAGTCCATCACT 1710
 D  P  M  N  P  K  W  R  A  V  P  Y  N  R  N  D  F  H  A  R  A  G  N  F  S  A  E  S  I  T   568

GCCCGAGTGCAGGAGCTGGCCGAGCAGGAGCCGTACAACCGCCTCGATGAGATCCTGGAGGATCTTGGAATCGAGGAGTAA        1791
 A  R  V  Q  E  L  A  E  Q  E  P  Y  N  R  L  D  E  I  L  E  D  L  G  I  E  E            594
```

FIG._5B

1 2 3 4 5 6 7 8 9 10 11 12

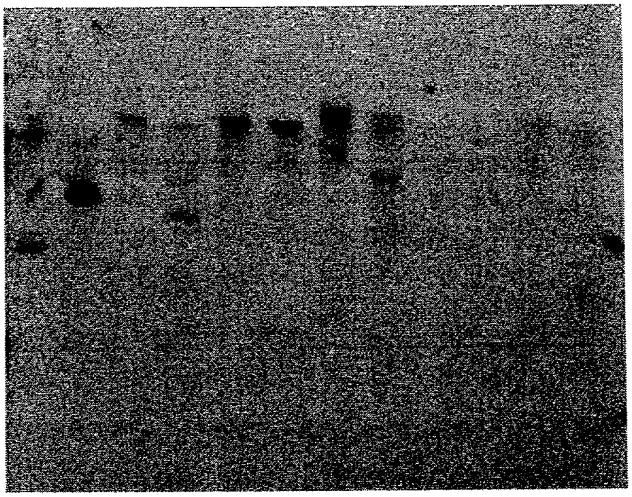

FIG._6

1 2 3 4 5 6 7 8 9 10 11 12

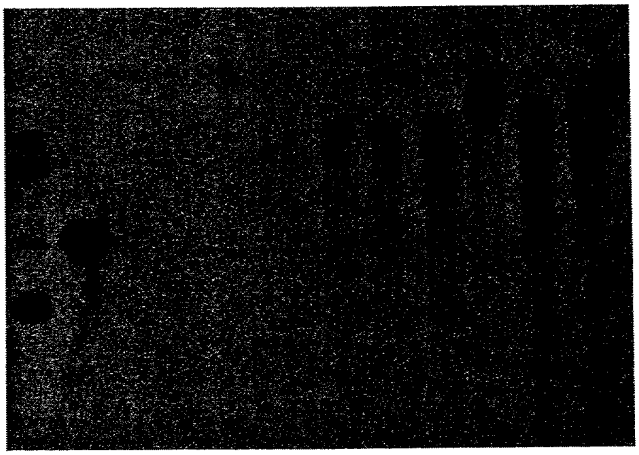

FIG._7

1 2 3 4 5 6 7 8 9 10 11

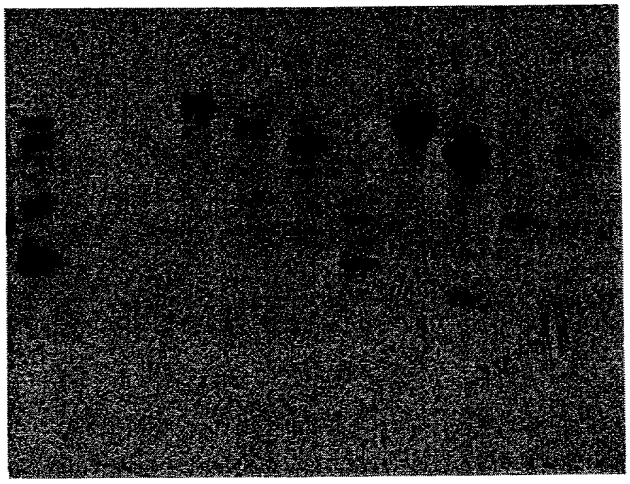

FIG._8

```
ATGGTTGCCA AATACCTCTT CTCGGCACTT CAACTCGCTT CAATTGCGAA AGGCATATAC GGCGTTGCTT TGAGCGAGCG TCCTGCCAAA TATATTGACG 100
AAACCCCCGA CGAAGAAAAG GCTGCCCTGG CAGCCATCGT TGAAGATGAC CCTGCCGATG TTTTCAGAAT CCTGAAGGAC TGGCAAAGCC CGGAGTATCC 200
CATCCTTTTT CGCGAGGCAC TGCCCATCCC TCCAGCCAAG GAACCGAAGT AGTGAGTCTT GAATTGCATG GACAGGTTTC CTAGAATATG CTCACCCATC 300
CGCAGTAAAA TGACGAATCC TGTCACAAAC AAGGAGATCT GGTACTACGA GATTGTCATC AAACCCTTTA ACCAACAGGT CTATCCAAGT CTACGTCCTG 400
CTCGCTTGGT AGGCTATGAT GGCATTTCAC CAGGCCCTAC GATCATCGTG CCGAGAGGAA CAGAAGCCGT TGTACGATTC GTAAACCAGG GTGATCGCGA 500
GAGTTCGATT CATCTTCATG GTTCTCCCTC CCGTGCCCCC TTTGACGGAT GGGCTGAAGA TTTGATTATG AAGGGCCAAT TCAAAGGTAC AACAGAACAA 600
TCTTATGCAT CAGGGTGCCT CTTTTATACT AACACGACTC GTTCTTAGAC TACTACTACC CGAACAACCA GGCTGCCAGA TTCCTGTGGT ACCACGATCA 700
TGCTATGCAT GTTGTAAGTC TTGCAGACTA ATCATGGGAG CGAAACGGAA AGATCGGGCT GACACTTATG CAGACTGCGG AAAATGCCTA TTTTGGACAG 800
GCTGGCGCCT ACCTGATCAC AGACCCAGCT GAGGACGCCC TCGGCCTTCC TTCGGGTTAC GGAAAATACG ACATCCCACT GGTGCTCAGT TCCAAGTTCT 900
ACAACAGTGA TGGAACTCTC CAGACCAGTG TGGGAGAAGA CAACAGTCTC TGGGGCGACG TCATCCATGT CAACGGTCAG CCCTGGCCAT TCTTCAACGT 1000
TGAGCCTCGA AAGTATCGCC TTCGATTCCT CAATGCGGCT GTTTCTCGGA ACTTTGCCCT CTATTTCGTC AAGCAACAAG CCACTGCTAC TAGACTTCCT 1100
TTCCAGGTCA TTGCCTCTGA TGCAGGGCTA CTCACGCACC CGGTCCAAAC CTCAGATATT TACGTGGCAG CAGCAGAGCG CTACGAGATT GTATTCGACT 1200
TTGCGCCTTA TGCAGGCCAG ACGATAGATT TGCGTAACTT TGCAAAGGCC AATGGGGTCG GCACCGATGA CGATTATGCA AACACTGACA AGGTCATGCG 1300
CTTCCATGTC AGCAGCCAAG CAGTCGTCGA TAACTCGGTG GTACCCGCAC AGCTATCTCA GATCCAGTTC CCCGCCGACA AAACCGGCAT CGACCACCAC 1400
TTCCGCTTCC ATCGCACCAA CAGCGAGTGG CGCATCAACG GCATCGGGTT TGCAGACGTC CAGAACCGTA TCCTGGCCAA GGTACCGCGC GGCACTGTCG 1500
AGCTATGGGA ACTCGAGAAC AGCTCCGGCG GCTGGTCGCA CCCCATCCAC GTCCACCTGG TCGACTTCCG AGTCGTCGCA CGCTACGGTG ACGAAAGCAC 1600
TCGCGGCGTC ATGCCCTACG AGTCCGCCGG TCTCAAGGAC GTCGTGTGGC TCGGCCGCCA CGAGACGGTG CTCGTCGAAG CACACTACGC CCCCTGGGAC 1700
GGAGTCTACA TGTTCCACTG CCACAACCTG ATCCACGAAG ACCAAGACAT GATGGCCGCG TTTGACGTGA CTAAGCTCCA GAACTTTGGC TACAACGAGA 1800
CGACGGATTT CCACGACCCG GAAGATTCTC GCTGGTCTGC AAGACCCTTC ACCGCGGCTG ACTTGACGGC GCGATCGGGT ATCTTCTCAG AAGCATCCAT 1900
CAGGGCTAGA GTGAACGAGT TGGCGCTGGA ACAGCCGTAC AGCGAACTGG CACAGGTCAC GGCCTCGCTC GAGCAGTACT ACAAGACGAA CAAGAAACGC 2000
CAGGCCGAGT GCGAAGACAT GCCTGCTGGC CCCATTCCCC GTTATCGCAG GTTTCAGGTC TGA                                            2063
```

FIG._9

```
MVAKYLFSAL QLASIAKGIY GVALSERPAK YIDETPDEEK AALAAIVEDD PADVFRILKD WQSPEYPILF REALPIPPAK EPNKMTNPVT NKEIWYYEIV 100
IKPFNQQVYP SLRPARLVGY DGISPGPTII VPRGTEAVVR FVNQGDRESS IHLHGSPSRA PFDGWAEDLI MKGQFKDYYY PNNQAARFLW YHDHAMHVTA 200
ENAYFGQAGA YLITDPAEDA LGLPSGYGKY DIPLVLSSKF YNSDGTLQTS VGEDNSLWGD VIHVNGQPWP FFNVEPRKYR LRFLNAAVSR NFALYFVKQQ 300
ATATRLPFQV IASDAGLLTH PVQTSDIYVA AAERYEIVFD FAPYAGQTID LRNFAKANGV GTDDDYANTD KVMRFHVSSQ AVVDNSVVPA QLSQIQFPAD 400
KTGIDHHFRF HRTNSEWRIN GIGFADVQNR ILAKVPRGTV ELWELENSSG GWSHPIHVHL VDFRVVARYG DESTRGVMPY ESAGLKDVVW LGRHETVLVE 500
AHYAPWDGVY MFHCHNLIHE DQDMMAAFDV TKLQNFGYNE TTDFHDPEDS RWSARPFTAA DLTARSGIFS EASIRARVNE LALEQPYSEL AQVTASLEQY 600
YKTNKKRQAE CEDMPAGPIP RYRRFQV                                                                                  627
```

FIG._10

```
MVAKYLFSALQLASIAKGIYGVALSERPAKYIDETPDEEKAALAAIVEDDPADVFRILKDWQSPEYPILFREALPIPPAK
||||||||||||| |||||||||||||||||| | |||||||||| |||||||||  ||||||||||  ||  |||||||
MVAKYLFSALQLVSIAKGIYGVALSERPAKFVDNTPDEEKAALASIVEDDPADVVNMLKDWQSPEYPLIFRQPLPIPPAK

EPNKMTNPVTNKEIWYYEIVIKPFNQQVYPSLRPARLVGYDGISPGPTIIVPRGTEAVVRFVNQGDRESSIHLHGSPSRA
||||  |||||||||||||||||||| |||||||||||||||||||||||||||||||||||||||||  ||||||||||||||||||
EPNKLTNPVTNKEIWYYEIVIKPFTQQVYPSLRPARLVGYDGISPGPTIIVPRGTEAVVRFINQGDRESSIHLHGSPSRA

PFDGWAEDLIMKGQFKDYYYPNNQAARFLWYHDHAMHVTAENAYFGQAGAYLITDPAEDALGLPSGYGKYDIPLVLSSKF
||||||  |  ||||  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
PFDGWADDMIMKGEYKDYYYPNNQAARFLWYHDHAMHVTAENAYFGQAGAYLITDPAEDALGLPSGYGKYDIPLVLSSKY

YNSDGTLQTSVGEDNSLWGDVIHVNGQPWPFFNVEPRKYRLRFLNAAVSRNFALYFVKQQATATRLPFQVIASDAGLLTH
||  ||||  ||||||  |  |||  ||||||||||  |||||||||||||||||||||||||||  ||||||||||||||||||
YNADGTLKTSVGEDKSVWGDIIHVNGQPWPFLNVEPRKYRLRFLNAAVSRNFALYFVKQDNTATRLPFQVIASDAGLLTH

PVQTSDIYVAAAERYEIVFDFAPYAGQTIDLRNFAKANGVGTDDDYANTDKVMRFHVSSQAVVDNSVVPAQLSQIQFPAD
||||||  |||||||||||||||||||||  ||||||||||  |||||||||||||||||||||  |||||||||  ||||||||||
PVQTSDMYVAAAERYEIVFDFAPYAGQTLDLRNFAKANGIGTDDDYANTDKVMRFHVSSQTVVDNSVVPEQLSQIQFPAD

KTGIDHHFRFHRTNSEWRINGIGFADVQNRILAKVPRGTVELWELENSSGGWSHPIHVHLVDFRVVARYGDESTRGVMPY
||  ||||||||||||  ||||||||||||  ||  |||||||||||||||||||||||||||||||||||||||||||||||||||  |||||||
KTDIDHHFRFHRTNGEWRINGIGFADVENRVLAKVPRGTVELWELENSSGGWSHPIHVHLVDFRVVARYGDEGTRGVMPY

ESAGLKDVVWLGRHETVLVEAHYAPWDGVYMFHCHNLIHEDQDMMAAFDVTKLQNFGYNETTDFHDPEDSRWSARPFTAA
|  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||  |||||||||
EAAGLKDVVWLGRHETVLVEAHYAPWDGVYMFHCHNLIHEDQDMMAAFDVTKLQNFGYNETTDFHDPEDPRWSARPFTAG

DLTARSGIFSEASIRARVNELALEQPYSELAQVTASLEQYYKTNKKRQAECEDMPAGPIPRYRRFQV
||||||||||||  ||||||||||||||||||||||||||||||||||||  ||  ||||||||||||||||||
DLTARSGIFSEESIRARVNELALEQPYSELAQVTASLEQYYKTNQKRHDECEDMPAGPIPRYRRFQV
```

FIG._11

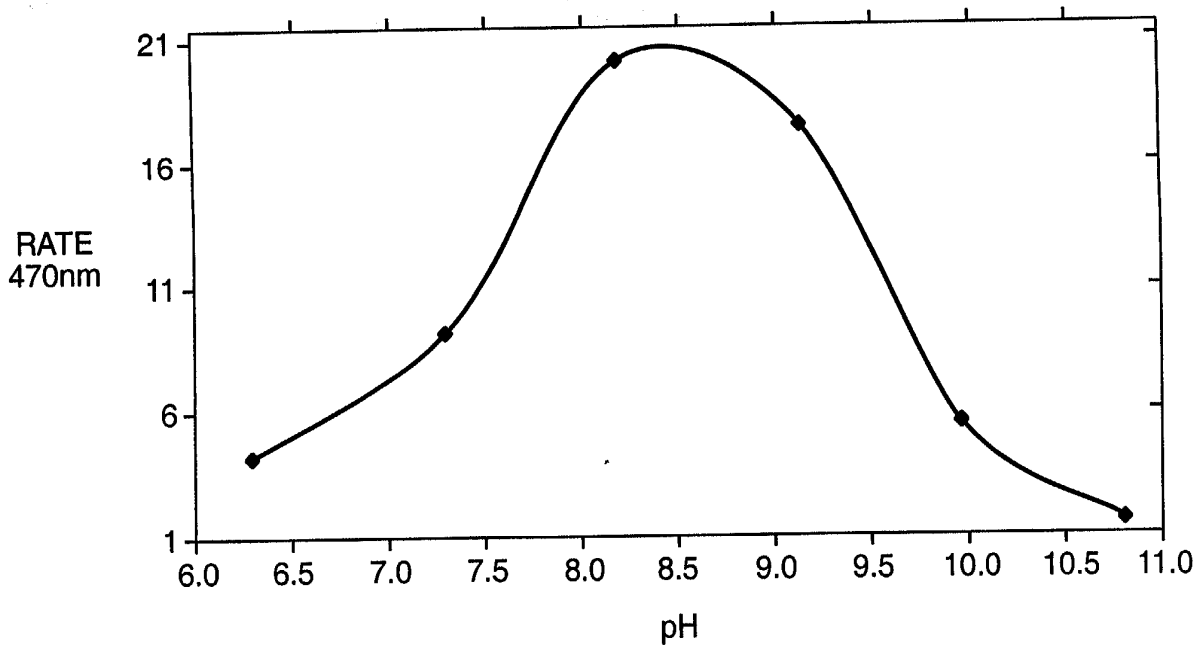

FIG._12


```
S.chartarum   TAENAYFGQAGAYIINDEAEDALGLPSGYGEFDIPLILTAKYYNADGTLR  50
A. atrum      TAENAYFGQAGFYILHDPAEDALGLPSG--KYDVPLALSLQAVQQRRTLF  48
```

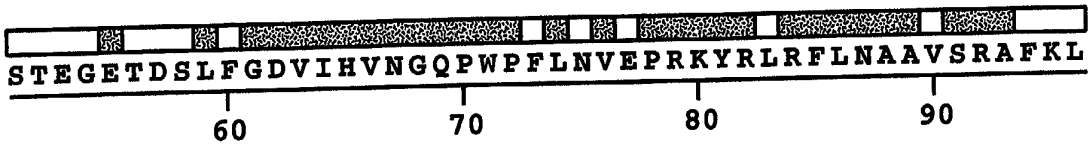

FIG._14

```
S.chartarum   STEGEDQDLWGDVIHVNGQPWPFLNVQPRKYRFRFLNAAVSRA       93
A. atrum      DPKDETDSLFGDVIHVNGQPWPYLKVEPRKYRLRFLNAAISRAFKL    94
```

```
CACCGCCGAGAACGCTTACTTTGGTCAAGCTGGCTTTTACATTCTGCACGACCCCGCTGAAGATGCATTGGGTCTG  76
  T   A   E   N   A   Y   F   G   Q   A   G   F   Y   I   L   H   D   P   A   E   D   A   L   G   L
CCTTCTGGCAAGTATGATGTACCTCTTGCACTGTCCTCCAAGCAGTACAACAGCGACGGTACCCTCTTCGACCCCA 152
  P   S   G   K   Y   D   V   P   L   A   L   S   L   K   A   Y   N   S   D   G   T   L   F   D   P
AGGACGAGACCGATTCACTGTTCGGCGATGTCATCCACGTCAACGGACAGCCATGGCCCTACTTTAAGGTCGAGCC 228
K   D   E   T   D   S   L   F   G   D   V   I   H   V   N   G   Q   P   W   P   Y   L   K   V   E   P
TCGCAAGTACCGTCTCCGCTTCCTCAATGCTGCTATCAGCCGTGCCTTCAAGCTCACTTTCGAGGCTGATGGCAAA 304
  R   K   Y   R   L   R   F   L   N   A   A   I   S   R   A   F   K
GTGATCAACTTTCCTGTCATCGGTGCCGATACTGGTCTCTTGACCAAGCCTGTTCAGACAAGCAACCTTGAGATCT 380
CTATGGCCGAGCGCTGGGAGGTTGTTTTTGACTTCAGCCAATTTTCCGGGAAGAACGTCACCCTCAAGAACGGTCG 456
CGATGTGCAGCACGATGAGGACTACAACTCCACCGACAAAGTCATGCAGTTCGTTGTTGGCAAGGATGTTACGAGC 532
CAGGCTGGTAATGGCAACCTTCCCGGCTCTCTGCGCACTGTTCCCTTCCCTCCTAAGAAGGGGCGGAGTCGACAGG 608
AGCTTCAAGTTCGGCAGGGACCGGTGGCCAGTGGACTGTTAATGGCTTGACCTTCGCTGATGTCAACAACCGCATC 684
CTGGCTAAGCCCCCAACGTGGTGCCATCGAGGTTTTGGGAGCTTTGAGAACTTCCAGCGGNGGNTGGTCTTACCCT 760
                                V   W   E   L   E   N   T   S   S   G   G   W   S   Y   P
                                                    |
TGTCCACATCCACCTGGGTCGACTTTCCAGATNCTTGTCTTGCACTGGANGCAAGGCNCCCCGTTNTAACTNCNAN 836
  V   H   I   H   L                                                                        858
AAAGGAAGCACTTTCAAGGGCG
```

FIG._13